

Bot. Jahresber. 53 (1): 1074. 1932; Mold., Phytologia 2: 54. 1941; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 25 & 96. 1942; Mold., Alph. List Inv. Names Suppl. 1: 16. 1947; Mold., Alph. List Cit. 4: 1258. 1949; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 44 & 191. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 164. 1953; Alain in León & Alain, Fl. Cuba, imp. 1, 289--291. 1957; Mold., Résumé 52, 318, & 463. 1959; Mold., Fifth Summ. 1: 97 (1971) and 2: 568 & 895. 1971; Alain in León & Alain, Fl. Cuba, imp. 2, 2: 289--291. 1974.

A small shrub; branches tetragonal, the younger ones pilose with very short slightly curvate hairs; branchlets often transformed into spines or with the apex spinose; petioles 0.5--1 mm. long; leaf-blades subcoriaceous, rigid, very variable on each branch or branchlet, varying from orbicular, ovate, obovate, or elliptic to narrowly oblong, 4--12 mm. long, 2--6 mm. wide, apically rounded to obtuse or subobtuse, basally acute to obtuse, marginally with 1 or 2 teeth per side, scabrous above with short basally-inflated hairs, pilose along the venation beneath or subglabrous, the midrib and 2--4 secondaries sulcate-impressed above, prominent beneath, not reticulate-joined; peduncles to 3 mm. long in anthesis; heads semiglobose, to 6 mm. wide; basal bracts semi-oval or triangular, about 2.5 mm. wide, apically obtuse or rounded, marginally recurved; sepals 2, free, oblanceolate or oblanceolate-linear, about 1.5 mm. long, dorsally pilose; corolla 3 mm. long, apically pilosulous, the tube infundibular, the anterior 3 lobes of the limb semiorbicular, the posterior lobe twice as long and ovate-triangular, apically truncate; stamens inserted in the corolla-tube; anthers subsessile, included; style 1 mm. long; stigma unilateral.

This rare endemic Cuban species is based on *Ekman 15542* from among limestone rocks near Pastelillo, Camagüey, Cuba, collected in anthesis in December, deposited in the Stockholm herbarium. The species is known thus far only from the original collection.

Citations: CUBA: Camagüey: *Ekman 15542* (F--photo of type, N--isotype, N--photo of type, S--type, S--isotype, Si--photo of type, Z--photo of type).

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NOTES ON THE GENUS *KALAHARIA*

Harold N. Moldenke

Although our original intention was to prepare a complete and detailed monograph of this genus, as of all the other genera in this large and complex family, lack of available time now has rendered this plan untenable. It has seemed worthwhile, however, to place on record the miscellaneous notes, chiefly bibliographic and herbarium-derived, assembled on this genus by my wife and myself over the past fifty years, this being the 53rd genus so treated. The herbarium acronyms employed hereinafter are the same as those used by

me in all previous installments of these notes since 1932 and are fully explained in my "Fifth Summary of the *Verbenaceae*...." (1971) volume 2, pages 795 to 801.

*KALAHARIA* Baill., *Hist. Pl.* 11: 110--111. 1892.

Synonymy: *Kalacharia* Dinter, *Feddes Repert. Beih.* 2: 72. 1918.

Bibliography: Peters, *Naturwiss. Reise Mossamb.* 6 [Bot.]: 262. 1861; Oliv., *Journ. Linn. Soc. Lond. Bot.* 15: 96. 1876; Hook., *Icon.* 13: pl. 1221. 1877; Schinz, *Verhandl. Bot. Ver. Brand.* 31: 205--207. 1889; Baill., *Hist. Pl.* 11: 110--111. 1892; Gürke, *Engl. Bot. Jahrb.* 18: 180--181. 1893; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, imp. 1, 1: 679. 1893; Gürke in Engl., *Pflanzenw. Ost-Afr. C.* 340. 1895; Briq. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 1, 4 (3a): 169 & 172 (1895) and ed. 1, 4 (3a): 382. 1897; Henriques, *Bolet. Soc. Brot.* 16: 69. 1899; J. G. Baker in *Thiselt.-Dyer, Fl. Trop. Afr.* 5: 295 & 313. 1900; H. H. W. Pearson in *Thiselt.-Dyer, Fl. Cap.* 5: 221--222. 1901; Durand & Jacks., *Ind. Kew. Suppl.* 1, imp. 1, 101 & 102 (1901) and imp. 1, 232. 1903; Dalla Torre & Harms, *Gen. Siphonog.*, imp. 1, 433. 1904; DeWild., *Ann. Mus. Congo*, ser. 5, 3: 136. 1909; DeWild., *Comp. Kasai* 402--403. 1910; R. E. Fries, *Wissen. Ergebn. Schwed. Rhod.-Kong. Exped. Bot.* 1 (2): 273--275. 1916; Dinter, *Feddes Repert. Beih.* 2: 72. 1918; J. C. Willis, *Dict. Flow. Pl.*, ed. 5, 352. 1925; Wangerin, *Justs Bot. Jahresber.* 46 (1): 717. 1926; DeWild., *Etud. Fl. Bas Moy.-Congo* 1: 72 & 310. 1930; Junell, *Symb. Bot. Upsal.* 1 (4): 103 & 106--107, fig. 160. 1934; Range, *Feddes Repert. Spec. Nov.* 38: 256. 1935; Thomas, *Engl. Bot. Jahrb.* 18: [Gatt. Clerod.] 89--90 & 95. 1936; Durand & Jacks., *Ind. Kew. Suppl.* 1, imp. 2, 232. 1941; Mold., *Alph. List Inv. Names* 21. 1942; Mold., *Known Geogr. Distrib. Verbenac.*, ed. 1, 49--52 & 93. 1942; J. Hutchins., *Botanist South. Afr.* 476 & 511. 1946; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, imp. 2, 1: 679. 1946; Mold., *Alph. List Inv. Names Suppl.* 1: 7. 1947; H. N. & A. L. Mold., *Pl. Life* 2: 34. 1948; Mold., *Known Geogr. Distrib. Verbenac.*, ed. 2, 115, 117--121, & 187. 1949; J. C. Willis, *Dict. Flow. Pl.*, ed. 6, 352. 1951; Goossens, *Suid-Akrik. Blompl.* 188. 1953; Wild, *Vict. Falls Handb.* 158. 1953; Brenan, *Mem. N. Y. Bot. Gard.* 9 (1): 37. 1954; Wild, *South. Rhodes. Bot. Dict.* 96. 1954; Mold., *Phytologia* 5: 132. 1955; Angely, *Cat. Estat. Gen. Bot. Fan.* 17: 4. 1956; Anon., *Assoc. Etud. Tax. Fl. Afr. Trop. Index* 1955: 63. 1956; Durand & Jacks., *Ind. Kew. Suppl.* 1, imp. 3, 232. 1959; Mold., *Résumé* 142, 144, 147--149, 151, 152, 219, 269, 271, 274, 276, 301, 302, 427, & 458. 1959; G. Taylor, *Ind. Kew. Suppl.* 12: 76. 1959; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, imp. 3, 1: 679. 1960; Watt & Breyer-Brandwijk, *Med. Poison. Pl. S. East. Afr.*, ed. 2, 1048, 1372, & 1406. 1962; Dalla Torre & Harms, *Gen. Siphonog.*, imp. 2, 433. 1963; H. P. Riley, *Fam. Flow. Pl. S. Afr.* 129. 1963; Mold., *Resume Suppl.* 3: 16 (1962) and 12: 6. 1965; F. A. Barkley, *List Ord. Fam. Anthoph.* 76 & 177. 1965; Airy Shaw in J. C. Willis, *Dict. Flow. Pl.*, ed. 7, 595. 1966; C. A. Sm., *Common Names S. Afr. Pl.* 600 & 601. 1966; Friedrich-Holzhammer, Meeuse, & Meikle in *Merx-*

müller, Prodr. Fl. Südw. Afr. 13 (122): 4--6. 1967; Bouquet, Med. Trop. 28: 49--58. 1968; Richards & Morony, Check List Fl. Mbala 237. 1969; Rouleau, Guide Ind. Kew. 100 & 352. 1970; Farnsworth, Pharmacog. Titles 5 (10): vii & item 11360 (1970, 5 (11): v & item 15121 (1970), and 5: Cumul. Gen. Ind. 1971; Mold., Fifth Summ. 1: 230, 237, 243, 246, 248, 249, 254, 363, 456, 459, 466, & 477 (1971) and 2: 533, 760, 883, & 972. 1971; Anon., Biol. Abstr. 54 (4): B.A.S.I.C. S.143. 1972; Mold., Biol. Abstr. 54: 1725. 1972; Mold., Phytologia 23: 210, 421, & 508 (1972) and 25: 220, 231, 237, 240, & 508 (1973), and 26: 364, 371, 373, & 505. 1973; Airy Shaw in J. C. Willis, Dict. Flow. Pl., ed. 8, 610. 1973; Anon., Biol. Abstr. 56 (1): B.A.S.I.C. S.141. 1973; D'Arcy & Keating, Brittonia 25: 223 & 224. 1973; Hocking, Excerpt. Bot. A.23: 290 & 292. 1974; Mold., Phytologia 28: 458 & 509 (1974) and 34: 262 & 505. 1976; Thanikaimoni, Inst. Franç. Pond. Trav. Sect. Scient. Tech. 13: 126 & 328. 1976; Mold., Phytologia 36: 37 & 506. 1977; Mukherjee & Chanda, Trans. Bose Res. Inst. 41: 40, 44, & 47. 1978.

More or less pubescent spinose shrubs, the spines supra-axillary; leaves rather small, decussate-opposite, subsessile or short-petiolate, deciduous, simple, exstipulate; flowers large, solitary, axillary, hypogynous, perfect, zygomorphic; calyx gamosepalous, inferior, campanulate, 5-fid; corolla yellow or red, gamopetalous, distinctly zygomorphic, plainly bilabiate, the tube cylindrical, curved, swollen, the limb spreading, eventually reflexed, the lobes imbricate in bud, the frontal lobe innermost; stamens inserted in the corolla-tube, of 2 lengths, exerted during anthesis; filaments filiform; anthers 2-celled, the thecae basally free; pistil superior, 2-carpellary, single, with 2 subequal awn-shaped branches; ovary 1-celled, the placentae 4, bisected, arranged in 2 lateral pairs, with a central eventually rhomboid cavity; fruit drupaceous, not splitting into 4 separate pyrenes when mature.

A monotypic genus of tropical and southern Africa closely related to *Cyclonema* Hochst. Briquet (1895), Angely (1956), and Dalla Torre & Harms (1963) claim 2 species for the genus, but in my view there is only a single species with several subspecific taxa. Gürke (1895) recognized only one species, but Willis (1925, 1951) actually recognized four; Airy Shaw (1973) recognizes only one. Meeuse, in a letter to me dated December 9, 1953, says: "I see that you maintain [*Kalaharia*].....as a monotypic genus, although several authors have sunk it under *Clerodendrum*. I cannot see why it should be retained: spines occur in several *Clerodendrum* species (although perhaps not always of the same type) and the characters of flower and fruit seem to be well within the enormous range of variation in this genus." Actually, the supra-axillary spines of *Kalaharia* are morphologically very distinct from the always petiolar spines of *Clerodendrum* and the floral characters are those of *Cyclonema*, as are also the fruit characters; *Cyclonema* being a group certainly deserving of generic rank distinct from *Clerodendrum* Junell (1934) says of *Kalaharia*: "Diese afrikanische Gattung,

welche nur die angeführte Art umfasst, wurde von Briquet in die Subtribus *Viticeae* eingereiht. Briquet verdankte jedoch seine Kenntnis der Gattung nur der unvollständigen und hinsichtlich des Fruchtknotens verhältnismässig unklaren Beschreibung von Baillon..... Baker.....reicht die Gattung in die Sektion *Cyclonema* der Gattung *Clerodendron* ein. Die Notwendigkeit der Einreihung dieser Pflanze in diese Subtribus ergibt sich unmittelbar beim Studium des Gynäceums. In Fig. 160 ist ein Querschnitt des Fruchtknotens in der Höhe der Insertionsflächen der Samenanlagen wiedergegeben. Die Plazenten sind bis zur Fruchtwand gespalten, d.h. die beiden Fruchtblätter sind nur ganz wenig miteinander verwachsen, und die Fruchtblattmitten sind nur ganz schwach verdickt. Im obersten Teil des Fruchtknotens sind die Fruchtblattränder mit den mittleren Partien der Fruchtblätter verwachsen. Die vier Fruchtknotenfelder sind daher im oberen Teil des Fruchtknotens voneinander getrennt. Im unteren Teil des Fruchtknotens ist die Fruchtwandung innen in der Medianlinie verhältnismässig stark ausgebaucht. Die Fruchtblattränder sind wie gewöhnlich mit leitendem Gewebe ausgerüstet. Fig. 161 stellt einen Längsschnitt durch einen sehr jungen Fruchtknoten dar. Unterhalb der Mikropyle sieht man leitendes Gewebe. Ähnliche Bilder erhält man auch bei *Clerodendron trichotomum*. Bei *C. ugandense* und *C. myricoides* (Sekt. *Cyclonema*) hingegen reicht der Fruchtblattrand nicht unter die Mikropyle hinab (vgl. Fig. 158). Der Gynäceumbau stützt meines Erachtens nicht die Auffassung, dass *Kalaharia* zur Sektion *Cyclonema* von *Clerodendron* gehört. Eine grössere Ähnlichkeit hinsichtlich des Fruchtknotenbaus scheint mit der Sektion *Euclerodendron* vorzuliegen."

Some authors cite the Gürke work in Engler's *Botanischer Jahrbücher* as "1894", but actually pages 1 to 208 of this volume were issued in 1893 and only pages 209 to the end were issued in 1894.

*KALAHARIA UNCINATA* (Schinz) Mold., *Phytologia* 5: 132. 1955.

Synonymy: *Cyclonema spinescens* Oliv., *Journ. Linn. Soc. Lond. Bot.* 15: 96. 1876 [not *C. spinescens* Klotzsch, 1861]. *Clerodendron uncinatum* Schinz, *Verhandl. Bot. Ver. Brand.* 31: 206--207. 1890. *Kalaharia spinipes* Baill., *Hist. Pl.* 11: 111. 1892. *Clerodendron spinescens* (Oliv.) Gürke, *Engl. Bot. Jahrb.* 18: 180--181. 1893. *Clerodendron spinescens* Gürke in *Engl., Pflanzenw. Ost-Afr. C:* 340, in syn. 1895. *Kalaharia spinescens* (Oliv.) Gürke in *Engl., Pflanzenw. Ost-Afr. C:* 340. 1895. *Kalaharia spinescens* Gürke apud J. B. Baker in *Thiselt.-Dyer, Fl. Trop. Afr.* 5: 313, in syn. 1900. *Kalaharia spinescens* Dinter, *Feddes Repert. Spec. Nov. Beih.* 2: 72. 1918. *Clerodendron spinescens* (Oliv.) Gürke apud Thomas, *Engl. Bot. Jahrb.* 18: 89. 1936. *Clerodendron uncinatum* Schinz apud G. Taylor, *Ind. Kew. Suppl.* 12: 76. 1959. *Clerodendron spinescens* Gürke ex Watt & Breyer-Brandwijk, *Med. Poison. Pl. S. East. Afr.*, ed. 2, 1372, in syn. 1962. *Kalaharia uncinata* Mold. ex Watt & Breyer-Brandwijk, *Med. Poison. Pl. S. East. Afr.*, ed. 2, 1406, in syn. 1962. *Clerodendron uncinatum* Schinz ex Mold., *Fifth Summ.* 1: 459, in syn. 1971. *Clerodendron uncinatum* Schinz & Mold. ex Mold., *Fifth*

Summ. 1: 466, in syn. 1971. *Kalaharia uncinata* D'Arcy & Keating, *Brittonia* 25: 224. 1973.

Bibliography: See bibliography of the genus as a whole.

Illustrations: Hook., *Icon.* 13: pl. 1221. 1877; Junell, *Symb. Bot. Upsal.* 1 (4): 103, fig. 160 & 161. 1934.

A perennial upright or decumbent subshrub or shrub, with pyramidal branching when erect and to 0.5 m. tall; branches gray-green, woody, angular or terete, densely pubescent with sharp-pointed basally weak hairs, flattened and widened at the nodes, mostly armed with small hooked or straight axillary or slightly supra-axillary pubescent spines to 6 mm. long at the lower nodes and shorter than the subtending leaves, the straight spines normally larger than the hooked ones; principal internodes usually about 2 cm. long; leaves decussate-opposite; petioles 0.6--5 cm. long; leaf-blades elliptic or ovate or suborbicular or subobovate, subcoriaceous, 1.5--4.7 cm. long, 7--15 mm. wide, apically rounded and minutely apiculate, marginally entire, basally narrowed, densely pubescent on both surfaces, sometimes with a silky sheen; secondaries 3--5 per side, spreading, obscure above, distinct beneath; inflorescence axillary, pedunculate, replacing the spines in the upper leaf-axils, usually opposite but occasionally with one inflorescence and one ca. 12 mm. long spine opposite each other at a node, cymose but usually reduced to a single flower; peduncles about 12 mm. long, densely pubescent, ampliate basally, 2-bracteate above the middle; bracts linear, 4--6 mm. long, pubescent; prophylla 2, awl-shaped, 1.5--2 mm. long, more or less long-pilose, situated directly beneath the shortly glandular-pubescent flower; calyx campanulate or infundibular, 6--12 mm. long, externally densely hirsute or pubescent both externally and within, glandular, the rim 5-toothed, the teeth ovate, rather shorter than the tube, unequal, apically acute; corolla golden-yellow, pure yellow, or very slightly pinkish, pubescent, the tube upwardly curvate, somewhat ampliate, twice as long as the calyx, usually about 1.3 cm. long and 2 mm. wide, puberulous within, the limb 5-lobed, the lobes unequal, the lower one obovate-cuneate, concave, about 1.8 cm. long, apically rounded or subtruncate, surpassing the upper, basally about 3 mm. wide, apically abruptly ampliate to 8 mm., the remaining upper 4 lobes oblong or obovate, shorter and somewhat narrower, apically obtuse or subacute, 7--12 mm. long, 5--7 mm. wide; stamens about 2.5 cm. long; filaments inserted in the corolla-tube, inwardly rolled in bud, puberulous, basally ampliate, 1.2--2.5 cm. long, during anthesis exerted about 1.4 cm. from the corolla-mouth; anthers 3--4 mm. long, separated half way from the base; pistil barely surpassing the stamens, somewhat dilated basally, 1.2--2.5 cm. long, apically shortly bifid; ovary barrel-shaped, 3--4 mm. long, glabrous, incompletely or completely 4-celled, usually with at least a partial central cavity.

Schinz (1890) comments that "Obwohl ich diese höchst interessante Pflanze einstweilen der Gattung *Clerodendron* untergeordnet habe, so bin ich mir doch wohl bewusst, dass sie an dieser Stelle

sur Zeit noch recht isolirt ist, denn sie oben erwähnte Centralhöhle im Fruchtknoten deutet doch entschieden darauf hin, dass die Frucht als aus 4 Nüsschen bestehend gedacht werden muss. Bei *Clerodendron* ist das Ovarium nach Bentham und Hooker unvollständig 4-fächerig, bei meiner Pflanze dagegen vollständig gefächelt und die Möglichkeit ist daher keineswegs ausgeschlossen, dass dieselbe noch einer besondern Gattung erhoben wird. Schliesslich sei noch auf die eigenartige Bewaffnung des *C. uncinatum* aufmerksam gemacht, die an jene von *C. aculeatum* erinnert, indessen sind es dort die Blatt-, hier aber die Blütenstiele, also die Achselproducte der Blätter, die sich zu Dornen umwandeln."

*Cyclonema spinescens* Oliv. is based on Cameron s.n. from "Lake Tanganyika or region round about", deposited in the Kew herbarium.

Recent collectors describe *Kalaharia uncinata* as a small shrub, subligneous rampant subshrub, or small shrubby bush, or even as a "many-headed perennial" (Gossweiler), "long prostrate herb", or "jährlich austreibendes Kraut" (Giess), deep-rooted, "evergreen", 0.6--3 m. tall (or long), usually found in open sunny exposure and blooming in the dry season; the stems and branches usually prostrate, radiating from the base, with small spines; petioles to 3 cm. long; leaf-blades obovate or spatulate, 12--26.5 cm. long, 4--8 cm. wide, basally long-attenuate into the petiole; fruit globular, edible, sweet. They have encountered it growing on savannas, in dry sandy open areas, on red sandy soil, and near old cultivations, at 300--1300 m. altitude, in flower from June to September and in December and February, in fruit from July to September. Geiss 9774, Rodin 9391, and Story 6258 are said to represent a juvenile form with "soft leaves and spines". Wild also refers to the plant as "herbaceous" and Robyns speaks of it as a "plante herbeuse rampante". Story reports it "uncommon in sandy open woodlands" in Namibia, but Gossweiler found it frequent in the Kalahari sands in what he calls "hemifruticeta" and "rhizomato-fruticeta" of the sandy, consolidated, alluvial dunes. He notes concerning it: "arbusto sempre verde, caules prostados, planta tipica da Chana de borracha Rhizomato-fruticeta". Almost unbelievably, Peters claims to have found it in the rainforest at Victoria Falls! Louis refers to the "aiguillons crochus stipulaires", but no other author or collectors to my knowledge has regarded the spines as stipular in origin!

The corollas of the type collection are described as having been pinkish-golden-yellow [orange?]. They are said to have been "yellowish" on Gossweiler 13577, "bright-yellow" on Gossweiler 14054 & 14054a, and "yellow" on Allen 402, Cabra & Michel 11, Carlier 71, Germain 2586, Gossweiler 13577, Lebrun 6189, Liben 3114, and Louis 63. Collections on whose accompanying labels no mention is made of corolla color are cited by me here as probably representing the typical or "normal" and commonest form of the species -- as has been my policy throughout this series of papers.

The species is based on a Schinz collection from Gorekas, "about 90 miles north of the Tropic" in the northwest Kalahari Desert of Namibia. Pearson (1901) notes that "The range of the species in South Africa will therefore probably be extended to the Western Ka-

lahari and Namaqualand". He cites only *Holub s.n.* from Botswana.

Vernacular names recorded for the species are "kakõlu-hashì", "kikosa", "kilubre", "kinhosa-kiluba", "lukato", "namuteketa", "nquanquabulana", "osiosita" [=thorn-snake], "papha", "root-wag-n-bietjie" [applied also to *Acacia gillettae*], "talala", "tsakutende", "uquanquabulana", and "zalata".

Baker (1900) cites *Hens 57* from "Lower Congo", *Johnston s.n.* and *Marques 342* from Angola, *Descamps s.n.* and *Pogge 547* from Zaire, *Bohm & Reichardt 161* and *Cameron s.n.* from Tanzania, *Carson s.n.* & *Nutt s.n.* from Uganda, and *Baines s.n.*, *Fleck 230*, *Kirk s.n.*, *Nels 30*, and *Schinz 456* from Nyasaland. Range (1935) cites *Range 766 & 1459*. Wild (1953) cites *Allen 402*, *Hutchinson 3426*, and *Rogers 5329 & 7537* from Victoria Falls. Friedrich-Holzhammer and his associates (1967) cite *Dinter 7662*, *Leistner 1813*, *Merxmüller & Giess 1225*, *Seydel 3674*, and *Story 5260* from Namibia. Gürke (1893) cites *Bohm & Reichardt 161*, *Cameron s.n.*, *Fleck 230*, *Nels 30*, *Pogge 547*, *Schinz 456*, & *Stuhlmann 438*.

Thomas (1936) cites the following collections: TANZANIA: *Goetze 1088*, *Holst 2798*, *Prittwitz 191*, *Stuhlmann 438*. NYASALAND: *Buchanan 391*, *Carson s.n.*, *Rowes 95*, *Scott Elliot 8360*. ZAIRE: *Pogge 661*, *662*, *663*, *664*, *665*, *Schlechter 12589*. ANGOLA: *Antunes A.21*, *Baum 63*, *Johnston s.n.*, *Pogge 547*. NAMIBIA: *Dinter 2277 & 2654*, *Fleck 230*, *Range 1459*, *Schinz 456*, *Seiner 30*, *101*, & *322*, *Throta 19a*. ZAMBIA: *Seiner s.n.*

A specimen in the Brussels herbarium bears an annotation to the effect that the plant is used as a "remède contre les maux de tête; traitement par la vapeur de la concoction de racine; la tête est placée au dessus du récipient bouillant, couverte par un linge, sudation abondante. Une séance par jour jusqu'a amelioration des douleurs." De Saeger reports that "la decoction de la racine est utilisée comme vomitif violent contre les piqûres de serpents". Riley (1963) says that the plant is used to treat bilharzia. Wild (1954) asserts that it is reputed to be poisonous in Zimbabwe. De Wildeman (1910) notes that "Les feuilles sechées et pilées avec du sel sont employées pour guerir les rhumes de poitrine."

Watt & Breyer-Brandwijk (1962) tell us that "A pint of cold infusion of the root.....is drunk twice a month by a woman of the Bemba and related tribes as a contraceptive. These tribes also use a decoction of the root as a gargle in sore throat. The plant has been reported as having been the cause of poisoning in cattle..... but no details are available."

It should be noted that the Pearson (1901) reference to this species in the bibliography (above) is sometimes cited as "1912", but pages 1--222 of the work in question were actually issued in 1901. The Gürke (1895) reference is sometimes given as "p. 320", but this appears to be an error for p. 340. This same author's 1893 work is sometimes incorrectly cited as "1894" (the titlepage date), but pages 1--208 actually appeared in 1893. Similarly, the Schinz (1890) reference is sometimes erroneously cited as "1889". Farnsworth (1970) erroneously cites the reference to *Kalaharia uncinata* as "item 15105 -- actually it occurs only in item 15121.

Material of this species has been misidentified and distributed

in some herbaria as *Clerodendrum kentrocaule* Bak., *Stachytarpheta* sp., *Zizyphus* sp., and even "Capparidaceae". On the other hand, the Carnochan 71 and Gates 213, distributed as typical *K. uncinatum*, actually represent var. *hirsuta* (Mold.) Mold. and Brass 16881, Quarré 3434 & 4217, and Seydel 3674 represent f. *rubra* Mold., while Mullenders 610 is something in the Apocynaceae.

Citations: ZAIRE: Achten 100a (Br, Br, Br), 100b (Br); Becquet 919 (Br); Bequaert 24 (Br), 32 (Br, W--1659340), 78 (Br), 7140 (Br); Bredo 3023 (Br), 3211 (Br), 4105 (Br); Cabra & Michel 11 (Br); Callens 4079 (N); Callewaert s.n. [17 Mai 1911] (Br); Carlier 71 (Mu); Collector undetermined 253 (Br); Couteaux 1040 (Br, Br, Br, Br, N); DeSaeger 80 (Br); Descamps s.n. [Katanga] (Br); Dubois 1247 (Br, Br); Flamigni 183a (Br); Gentil s.n. [Juil. 1902] (Br); Germain 2586 (Br); Gillet 691 (Br), s.n. [1900] (Br, N), s.n. [1903] (Br), s.n. [1909] (Br); Hens B.57 (Br); Herb. Jard. Bot. Brux. s.n. [Ankoro, 8 avril 1937] (Br), s.n. (Br, Br); Hock s.n. [juin 1910] (Br), s.n. [septembre 1911] (Br); Laurent 485 (Br); Laurent & Laurent s.n. [19/11/05] (Br); Lebrun 6189 (Br, Br); Liben 3114 (Mu); Louis 63 (Br); Luxen 58 (Br, Br), F.77 (Br); Mortelmeux 13 (Br); Quarré 3456 (Br, Br, Br, Br), 3263 (Br, Br), 5185 (Br); W. Robyns 288 (Br); F. A. Rogers 10270 (Br); RRPP. Salesiens S.290 (Br), S.486 (Br); Sapin s.n. [1906] (Br), s.n. (Br, Br); R. Schlechter 12589 (Br); Sparano 64 (Br); Triébaud 653 (Mu); Vanderyst 1907 (Br), 9919 (Br), 17215 (Br), 20400 (Br, Br), 21071 (Br), 21116 (Br), 21438 (Br), 22246 (Br), 23089 (Br, Br), 23789 (Br), 24015 (Br, Br), 29002 (Br, Br), 29869 (Br), 29885 (Br), 30002 (Br), 30003 (Br), 32167 (Br, Br), 32596 (Br, Br, Br), 32606 (Br, Br), 32667 (Br, Br, Br), 33325 (Br, Br, N), 34042 (Br), 34305 (Br), s.n. [Kisantu, Sept. 1908] (Br), s.n. [aôut 1908] (Br); Verdick 24 (Br), 268 (Br), 587 (Br). ANGOLA: Lunda: Gossweiler 86 (Ul), 13445 (Ld, Ul), 13577 (B, Ul, W--2074072), 13577b (Ul), 14054 (Ul, W--2074423), 14054a (B). ZAMBIA: Borle 319 (S); Bredo 4002 (Br, N); Pole-Evans 2767 [24] (Rh); E. A. Robinson 3926 (Mu-3926); F. A. Rogers 26112 (S). ZIMBABWE: C. E. F. Allen 402 (Rh); Dinter 7662 (S); Peter 30816 [V.27] (B), 51070 [S.62] (B); Wild 357 [Herb. Govt. S. Rhodes. 13823] (N). NAMIBIA: Baum 63 (Mu--3917); Bradfield 181 (Z); Dinter 7662 (Mu); Finke 3674 (Mu); Giess 9774 (Mu); Peter 47384 (B); Rehm s.n. [Grootfontein, 17.11.39] (Mu); Rodin 9391 (Mu); Seydel 3674 (N); Story 6258 (Mu). BOTSWANA: Van Son s.n. [Herb. Transv. Mus. 29035; Natal Herb. 27106] (N, N--photo, Na, S--photo, Z--photo). CULTIVATED: Zaire: Vanderyst 24620 (Br).

KALAHARIA UNCINATA var. HIRSUTA (Mold.) Mold., Phytologia 5: 132. 1955.

Synonymy: *Kalaharia spinescens* var. *hirsuta* Mold., Phytologia 3: 418. 1951.

Bibliography: Mold., Phytologia 3: 418 (1951) and 5: 132. 1955; Anon., Assoc. Étud. Tax. Fl. Afr. Trop. Index 1955: 63. 1956; Mold., Résumé Suppl. 3: 16 (1962) and 12: 6. 1965; Mold., Fifth Summ. 1: 230, 237, 243, 248, & 254 (1971) and 2: 533 & 883. 1971; Mold.,



Phytologia 36: 37. 1977.

This variety differs from the typical form of the species in having the stems, branches, branchlets, spines, leaves, peduncles, and calyxes densely spreading-hirsute, and the corollas red or scarlet.

The variety is based on *Burtt 3806* from Kazikazi, Tanzania, at 4200 feet altitude, collected on July 14, 1932, and deposited in the Brussels herbarium.

Collectors have described this plant as a small, spreading or straggling, shrubby herb or low bushy or climbing shrub, 0.3--1.5 m. tall, the stems often prostrate, the spines recurved, and the corolla-lobed reflexed. They have found it growing in sandy soil with full exposure to the sun, along roadsides, in grass on dry ground in woodland, in low grass on village greens, on flat sandy open-forest plains, and in open bush-veld with *Acacia*, *Zizyphus*, *Grewia*, and other low trees, at altitudes of 800--2300 m., in flower from June to August and in December. Lovemore asserts that it is common in the Kalahari sand-veld woodlands of Zimbabwe, while Bullock says that it is a common ruderal plant in black soil up to 7000 feet altitude in Tanzania. The only vernacular names recorded for it are "mukotakipwa" and "osijoseuta".

The corollas are said to have been "red" on *Bullock 3007*, *Lovemore s.n.*, and *Rodin 2710*, "orange-red" on *Pritchard 300*, "bright-red" on *Gates 213*, "scarlet" on *Richards 25850*, and "flame" or "coral-flame" on *Leach & Bayliss 13036*. The pubescence is shorter than normal for the variety on *Dinter 7662*.

Citations: ZAIRE: *Bredo 3262* (Br), *3303* (Br). TANZANIA: *Burtt 3333* (Br, Br, N), *3806* (Br--type, N--photo of type, Z--photo of type); *Bullock 3007* (B, S); *Carnochan 71* (S, W--2091737); *Goetze 1098* (Br); *Peter 34419* [V.118] (B), *34654* [V.122] (B), *35200* [V.130] (B), *35298* [V.132] (B); *Richards 25850* (Mu, N). ANGOLA: *Huila: Pritchard 300* (E--1674076, U1). ZAMBIA: *B. E. Gates 213* (N). ZIMBABWE: *Lovemore s.n.* [12/8/56] (S); *M. N. Mason s.n.* [Victoria Falls, Aug. 1911] (Br). NAMIBIA: *Dinter 7662* (B); *Leach & Bayliss 13036* (Mu, N); *Loeb & Koch 12* (Ca--958701), *304* (Ca--958702); *Rodin 2710* (Ca--802976). BOTSWANA: *Sow s.n.* [Herb. Transv. Mus. 29035] (S).

*KALAHARIA UNCINATA* var. *PARVIFLORA* (Schinz) Mold., *Phytologia* 28: 458. 1974.

Synonymy: *Clerodendron spinescens* var. *parviflora* (Schinz) Gürke, *Engl. Bot. Jahrb.* 18: 181. 1893. *Kalaharia spinescens* var. *parviflora* (Schinz) R. E. Fries, *Wiss. Ergebn. Schwed. Rhod.-Kong. Exped. Bot.* 1 (2): 274. 1916. *Clerodendrum uncinatum* var. *parviflora* Schinz apud Thomas, *Engl. Bot. Jahrb.* 18: 90, in syn. 1936. *Kalaharia uncinata* var. *paaviflora* [Mold.] ex Anon., *Biol. Abstr.* 56 (1): B.A.S.I.C. S.141, sphalm. 1973.

Bibliography: Gürke, *Engl. Bot. Jahrb.* 18: 181. 1893; R. E. Fries, *Wiss. Ergebn. Schwed. Rhod.-Kong. Exped. Bot.* 1 (2): 274. 1916; Junell, *Symb. Bot. Upsal.* 1 (4): 103 & 106, fig. 161. 1934; Thomas, *Engl. Bot. Jahrb.* 18: [Gatt. *Clerod.*] 90. 1936; Fedde &

Schust., Justs Bot. Jahresber. 60 (2): 573. 1941; Anon., Biol. Abstr. 56 (1): B.A.S.I.C. S.141. 1973; Mold., Biol. Abstr. 56: 69. 1973; Mold., Phytologia 25: 220, 231, 237, & 240. 1973; Hocking, Excerpt. Bot. A.23: 292. 1974; Mold., Phytologia 28: 458. 1974. Illustrations: Junell, Symb. Bot. Upsal. 1 (4): 103, fig. 161. 1934.

This poorly differentiated variety is said to differ from the typical form of the species in its thinner pubescence, longer and thinner peduncles, somewhat smaller flowers, and brilliantly red, less early caducous corollas. It is based on *Hens s.n.* from Stanley Pool and *Descamps 129* from Lualaba, Zaire, the former collected in 1887.

Fries (1916) cites *R. E. Fries 604* from Zambia and comments that the plant is "Ein halbmeterhoher Strauch auf Brandfeldern wachsend, die lebhaft ziegelroten Blüten Mitte Sept. schön entwickelt. Die Varietät, die sich von der Hauptform durch lichtere Behaarung, längere und dünnere Blütenstiele und etwas kleinere Blüten (letzteres an meinen Exemplare weniger auffallend) unterscheidet, ist vom oberen Kongo-Gebiet (Stanley-Pool und Lualaba) ausgegeben, weshalb mein Fund sich den übrigen geographisch gut anschliesst". He notes that the typical form has "leuchtend roten Blüten fangen Ende Juli an, sich zu öffnen", but this statement probably refers to f. *rubra* Mold. The small-flowered variety is not mentioned by Schinz (1889) as claimed by Thomas (1936), but only typical "*Clerodendron uncinatum*" is there discussed.

Citations: ZAIRE: *Descamps 129* (Br--cotype); *Hens s.n.* [Congo 1877] (Br--cotype).

*KALAHARIA UNCINATA* f. *RUBRA* Mold., Phytologia 23: 210. 1972.

Bibliography: J. Hutchins., Botanist South. Afr. 476 & 511. 1946; Brenan, Mem. N. Y. Bot. Gard. 9 (1): 37. 1954; Anon., Biol. Abstr. 54 (4): B.A.S.I.C. S.143. 1972; Mold., Biol. Abstr. 54: 1925. 1972; Mold., Phytologia 23: 210 & 421 (1972) and 25: 231. 1973; Anon., Assoc. Étud. Tax. Fl. Afr. Trop. Index 1972: 56. 1973; Hocking, Excerpt. Bot. A.23: 290. 1974; Mold., Phytologia 34: 262. 1976.

This form differs from the typical form of the species in having deep-red or scarlet (rather than yellow) corollas. It is based on *Rodin 2710* from Namibia, collected in open bush-veld with *Acacia*, *Zizyphus*, *Grewia*, and other trees, near Otjiwarongo on the road to Outjo, on December 10, 1947, deposited in the United States National Herbarium at Washington.

It is of interest to note that var. *hirsuta* and var. *parviflora* also appear to be red-flowered. It is therefore rather unfortunate that the nomenclatural type of the species happens to be the yellow-flowered form.

Collectors describe the present form as a rounded, shrubby, perennial herb with a woody root, 0.4--1.2 m. tall, with curved spines and showy flowers, or as a small, erect or wide-spreading spiny shrub, "half-shrub", or shrublet, branched from a woody base, often with erect soft branches to 18 inches tall, renewing

its growth after brush-fires, the leaves opposite, aromatic, oval, very deep-green, sticky, with a sharp downwardly recurved spine "at each petiole base (but not petiolar)". They have found it growing in dry waste ground, in yellow sand, and on open savannas in red sandy soil of slopes between dunes, at 1000--1400 m. altitude, in flower in April, June to August, and December to February. Robinson calls it a "common very beautiful but noxious weed in agricultural lands". Brass found it "occasional on roadsides in open woodlands". Leistner describes it as "frequent". Story found it "locally frequent in open woodlands of *Burkea*, *Ochna*, and *Acacia* on sand. The only vernacular names recorded for the plant are "dale" and "kikosa".

The corollas are described by collectors as having been "red" on *Borle* 319, *Brass* 16881, *Codd* 5849, *Merxmüller* 1225, *Rodin* 2710, and *Story* 5260, "rose" on *Quarré* 3434, "very vivid red" on *Quarré* 4217, "blood-red" on *Seydel* 3674, "scarlet" on *Hutchinson* 3426 & 3882 and *Winter* 7501, "scarlet and yellow" on *Robinson* 2401, "cinnabar-red with yellow throat" on *Giess & al.* 6651, and "crimson with yellow center" on *Leistner* 1813.

*Hutchinson* (1946) cites his nos. 3426 & 3882.

Citations: ZAIRE: *Quarré* 3434 (Br, Br, Br), 4217 (Br, Br, Br, Br, N). ZAMBIA: E. A. *Robinson* 2401 (Ba). ZIMBABWE: *Borle* 319 (W--1028989). MALAWI: *Brass* 16881 (N). NAMIBIA: *Codd* 5849 (Ss); *Giess, Volk, & Bleissner* 6651 (Mu); *Leistner* 1813 (Mu); *Merxmüller* 1225 (Mu); *Rodin* 2710 (Ba--isotype, W--2062821--type); *Seydel* 3674 (N, W--2671434); *Story* 5260 (Mu, Mu). BOTSWANA: *Winter* 7501 (Mu).

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#### NOTES ON THE GENUS *KAROMIA*

Harold N. Moldenke

Lack of time this late in my life has made impractical the detailed monograph originally planned for this and all other genera of this family, but it has seemed worthwhile to place on record the bibliographic and herbarium notes assembled on the genus by my wife and myself over the past fifty years. Herbarium acronyms employed hereinafter are the same as used consistently since 1932 in all previous installments of these notes and are fully explained in my "Fifth Summary of the *Verbenaceae*....." (1971), volume 2, pages 795--801.

*KAROMIA* Dop, Bull. Mus. Hist. Nat. Paris, ser. 2, 4: 1052--1053. 1932.

Synonymy: *Karoma* Barkley, List Ord. Fam. Anthoph., ed. 2, 76 & 177. 1965.

Bibliography: Dop, Bull. Mus. Hist. Nat. Paris, ser. 2, 4: 1052--1053. 1932; Dop in *Lecomte, Fl. Gén. Indo-chine* 4: 891--893.